The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte MIKIO KATSUBE,
KAZUHIDE NITA, and
MASAAKI SEKINO

Appeal No. 2006-0763
Application No. 09/066,168

ON BRIEF

Before GARRIS, KRATZ, and FRANKLIN, Administrative Patent Judges.

FRANKLIN, Administrative Patent Judge.

DECISION ON APPEAL

This is an appeal under 35 U.S.C. § 134 from the examiner's final rejection of claims 1, 2, 5, and 6. A copy of each of these claims is set forth in the attached appendix.

Claims 1, 2, 5 and 6 stand rejected under 35 U.S.C. § 103 as being obvious over Sekino in view of Bikson, Etienne, and Matsuura.

The examiner relies upon the following references as evidence of unpatentability:

Sekino et al. (Sekino)	4,293,419	Oct. 6, 1981
Bikson et al. (Bikson)	5,160,042	Nov. 3, 1992
Etienne et al. (Etienne)	5,380,433	Jan. 10, 1995

Matsuura, "Synthetic Membranes and Membrane Separation Processes" CRC Press, page 314 (1994).

OPINION

I. The 35 U.S.C. § 103 rejection of claims 1, 2, 5 and 6

The examiner's position for this rejection is set forth on pages 4-6 of the answer. The examiner finds that Sekino teaches appellants' claimed invention except for a feed port provided at one end of the container, and a non-permeated fluid discharge outlet located as opposed to the outer surface of each element and extending through the container wall (Answer, page 4).

The examiner relies upon Bikson for teaching a feed port at the end of the container and for teaching a non-permeated fluid discharge outlet at any position along the container wall[1] (Answer, pages 4-5). The examiner asserts that the location of the non-permeated fluid discharge outlet in the module of Sekino is not critical, and concludes that therefore one skilled in the art would have been motivated to place the discharge at the end of the housing, either axially or through a container wall

[1] The Examiner refers to column 8, lines 29-50 and column 9, lines 31-36 of Bikson for allegedly teaching a non-permeated fluid discharge outlet at any position along the container wall. In column 8, Bikson states that the "[f]irst port **2** need not necessarily be positioned to introduce fluid feed at the center of pressure shell **4** if annular space **22** is wide enough to permit free flow without any build-up of pressure in annular space **22**; preferably, however, first port **2** is essentially at the center".

(Answer, page 5). The examiner relies upon Etienne and Matsuura as cumulative teachings for showing bundles provided within a housing having lateral non-permeated fluid discharge positioned substantially at the end of the housing and passing through the container wall (Answer, page 5).

Beginning on page 7 of the brief, appellants argue that there is no suggestion to combine Bikson with Sekino. Appellants argue that Bikson is a single stage (single fiber bundle) apparatus in which feed enters one end of the container and non-permeate exits through a central side outlet, and refers to Figure 5 of Bikson in this regard (Brief, pages 7-8). Appellants argue that there is nothing in either reference to suggest the substitution of Bikson's central feed tube into Sekino would result in either lower pressure loss across the module, or reduction of pressure-loss increasing sediment build-up near Sekino's non-permeate outlet. Appellants argue that such a substitution would require substantial redesign of Sekino to obtain a functioning permselective module (Brief, page 8).

We agree with appellants that the examiner has not come to terms with the fact that Bikson (as well as the references of Etienne and Matsuura) pertains to a single stage apparatus, whereas Sekino is a dual-stage apparatus.[2] Location of the feed port or non-permeated fluid discharge outlet in a single stage apparatus may not translate to the same location in a dual-stage apparatus. Certainly, the examiner has not explained how such teachings in a single-stage apparatus are transferable to a dual-stage apparatus. The examiner provides no explanation of the effects of altering Sekino (as suggested by the examiner)

[2] For example, a single stage apparatus has a different flow pattern than that set forth in Sekino.

that would occur in the resultant fiber membrane separation apparatus. As pointed out by appellants on page 2 of the reply brief, the examiner does not rebut the appellants' argument that the combination improperly requires substantial alteration of the operation of the references. On page 7 of the answer, the examiner asserts that the position of the non-permeated fluid discharge outlet of Sekino is not critical. However, as pointed out by appellants on page 4 of the reply brief, the examiner offers nothing to support such a statement. Appellants point out that Sekino teaches only an outlet through the face of a center plate that separates two equal length fiber bundles (Reply Brief, page 4).

We further note that appellants' claim 1 requires hollow fibers having one end closed and the other end opened, wherein the feed tubes form a conduit having one end opened and the other end closed, as depicted in appellants' Figure 1. The examiner does not explain how the applied art teaches this aspect of the claimed invention. For example, Sekino does not teach hollow fibers having one end opened and one end closed while the feed tube of each of the two elements form a conduit having one end opened and the other end closed.

In view of the above, we therefore agree with appellants' position that the examiner has failed to establish a prima facie case of obviousness. We therefore reverse the rejection.

II. Conclusion

The 35 U.S.C. § 103 rejection of claims 1, 2, 5 and 6 is reversed.

REVERSED

Bradley R. Garris)
Administrative Patent Judge)
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Peter F. Kratz) BOARD OF PATENT
Administrative Patent Judge) APPEALS AND
) INTERFERENCES
)
Beverly A. Franklin)
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Appeal No. 2006-0763
Application No. 09/066,168

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APPENDIX

1. A permselective membrane module comprising i) two permselective membrane elements formed of hollow fibers arranged substantially in parallel and bundled together and ii) a container, the two elements being arranged in the container longitudinally of the hollow fibers,

wherein the respective elements comprise i) a feed tube disposed longitudinally of the hollow fibers and ii) a hollow fiber bundle covering the outer surface of the feed tube, the feed tube having a number of holes therein, and the hollow fibers having one end closed and the other end opened,

wherein the feed tubes of the two elements communicate with each other via a connecting tube to form a conduit having one end opened and the other end closed,

wherein the container comprises i) an inner wall surrounding the two elements with a space, ii) a feed port provided at one end of the container in communication with the opened end of the conduit, iii) a permeate-liquid outlet facing the open end of the hollow fiber bundle of each element and extending through the container wall, and iv) a non-permeated fluid discharge outlet located as opposed to the outer surface of each element and extending through the container wall in communication with a gap and the outside of the container wall, and

further wherein the centerline of the discharge outlet of the container being substantially proximal to one end of the container whereby any space downstream of said outlet is sufficiently small to allow purging of suspended materials, thereby minimizing pressure loss in the permselective membrane module.

2. A permselective membrane module comprising i) two perm-selective membrane elements formed of hollow fibers arranged substantially in parallel and bundled together and ii) a container, the two elements being arranged in the container longitudinally of the hollow fibers,

wherein the respective elements comprise i) a feed tube disposed longitudinally of the hollow fibers and ii) a hollow fiber bundle covering the outer surface of the feed tube, the feed tube having a number of holes therein, and the hollow fivers having one end closed and the other end opened,

wherein the feed tubes of the two elements have one end opened and the other end closed,

wherein the container comprises i) an inner wall surrounding the two elements with a space, ii) a feed port provided at one end of the container in communication with the opened end of the feed tube of one of the elements, iii) an inner liquid receiving plate located between the two elements to collect the liquid not permeated through said one elements, iv) a connecting tube for connecting the inner liquid receiving plate with the open end of the feed tube of the other element, v) a permeate-liquid outlet facing the open end of the hollow fibers of each element and extending through the container wall, and vi) a non-permeated fluid discharge outlet located as opposed to the outer surface of the other element and extending through the container wall in communication with the space and the outside of the container wall, and

further wherein the centerline of the discharge outlet of the container being substantially proximal to one end of the container whereby any space downstream of said outlet is sufficiently small to allow purging of suspended materials, thereby minimizing pressure loss in the permselective membrane module.

5. A permselective membrane module comprising i) two perm-selective membrane elements formed of hollow fibers arranged substantially in parallel and bundled together and ii) a container, the two elements being arranged in the container longitudinally of the hollow fibers,

wherein the respective elements comprise i) a feed tube disposed longitudinally of the hollow fibers and ii) a hollow fiber bundle covering the outer surface of the feed tube, the feed tube having a number of holes therein, and the hollow fibers having one end closed and the other end opened,

wherein the feed tubes of the two elements communicate with each other via a connecting tube to form a conduit having one end and the other end closed,

wherein the container comprises i) an inner wall surrounding the two elements with a space and two end walls, ii) feed port provided at one end of the container in communication with the opened end of the conduit, iii) a permeate-liquid outlet facing the open end of the hollow fiber bundle of each element and extending through the end wall of the container adjacent to the open end of the hollow fiber bundle of each element, and iv) a non-permeated fluid discharge outlet located as opposed to the outer surface of each element and extending through the container wall in communication with a gap and the outside of the container wall, and

further wherein the centerline of the discharge outlet of the container being substantially proximal to one end of the container whereby any space downstream of said outlet is sufficiently small to allow purging of suspended materials, thereby minimizing pressure loss in the permselective membrane module.

6. A permselective membrane module comprising i) two perm-selective membrane elements formed of hollow fibers arranged substantially in parallel and bundled together and ii) a container, the two elements being arranged in the container longitudinally of he hollow fibers,

wherein the respective elements comprise i) a feed tube disposed longitudinally of the hollow fibers and ii) a hollow fiber bundle covering the outer surface of the feed tube, the feed tube having a number of holes therein, and the hollow fibers having one end closed and the other end opened,

wherein the feed tubes of the two elements have one end opened and the other end closed,

wherein the container comprises i) an inner wall surrounding the two elements with a space and two end walls, ii) a feed port provided at one end of the container in communication with the opened end of the feed tube of one of the elements, iii) an inner liquid receiving plate located between the two elements to collect the liquid not permeated through

said one elements, iv) a connecting tube for connecting the inner liquid receiving plate with the open end of the feed tube of the other element, v) a permeate-liquid outlet facing the open end of the hollow fibers of each element and extending through the end wall of the container adjacent to the open end of the hollow fiber bundle of each element, and vi) a non-permeated fluid discharge outlet located as opposed to the outer surface of the other element and extending through the container wall in communication with the space and the outside of the container wall, and

further wherein the centerline of the discharge outlet of the container being substantially proximal to one end of the container whereby an space downstream of said outlet is sufficiently small to allow purging of suspended materials, thereby minimizing pressure loss in the permselective membrane module.